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PAPERS READ
BEFORE THE
ROYAL GEOGRAPHICAL SOCIETY

I.—*Is the Quorra, which has lately been traced to its Discharge into the Sea, the same River as the Nigir of the Ancients?* By W. Martin Leake, Esq., V.P., F.R.S.

As there exists a difference of opinion on the propriety of applying the name Niger or Nigir to the river, of which the lower course and termination have lately been discovered, I am induced to submit to the Society a few remarks on this question, which immediately involves the greater one as to the extent of knowledge of the interior of Africa, acquired by the ancients. Upon the whole subject, it would have been sufficient to refer to D'Anville* and Rennell,† who favour the affirmative of the question, and on the opposite side to M. Walckenaer,‡ who, of all later writers, has examined it with the greatest diligence, had not recent discoveries furnished us with better grounds for forming a conclusive opinion, than even the latest of those authors possessed.

Maritime surveys have now completed a correct outline of Northern Africa. Major Laing, by ascertaining the source of the Quorra to be not more than 1600 feet above the sea, proved that it could not flow to the Nile; Denham and Clapperton demonstrated that it did not discharge itself into the lake of Bornú; and, at length, its real termination in a delta, at the head of the great gulf of the western coast of Africa, has rewarded the enlightened perseverance of the British Government, and the courage and enterprise of its servants. The value to science of this discovery, and the great merit of those whose successive exertions have prepared and completed it, is the more striking, when we consider that the hydrography of an unknown country is the most important step to a correct knowledge of its geography, and that in barbarous Africa nothing short of the ocular inquiries of educated men is sufficient to procure the requisite facts. It is curious to observe how the best collectors of oral information in that country have failed in arriving at the truth as to the origin, course, and termination of the rivers. Edrisi, Abulfeda, Leo Africanus,

* Mémoires de l'Académie des Inscriptions, vol. xxvi.

† Geography of Herodotus, sections 16, 22.

‡ Recherches Géographiques sur l'Intérieur de l'Afrique Septentrionale: an octavo of 517 pages, published at Paris in 1821.

Delisle, and Bruce, all came to the determination that the Quorra flowed from east to west.* Burckhardt, whose oral inquiries on Bornú have proved generally correct, concluded that the Shary flowed from N. E. to S. W. ; and Lyon, though particularly successful in his information on the countries not visited by him, was induced to confound the Shary of Bornú with the Tjad or Yéu, and, like Sultan Bello, to carry the Quorra, after passing Yáuri and Funda, into the lake Tjad, and from thence to Egypt. The most intelligent natives are confused when questioned on the subject of rivers, while the generality, unable to understand the object or utility of such inquiries, can neither inform the traveller whether two streams are different rivers or part of the same ; where any river rises or whither it flows ; and seem often to believe that all the lakes and streams of Africa are parts of one and the same water. It is not surprising, therefore, that ancients as well as moderns, having obtained the knowledge of a large river flowing to the east, should have supposed that it was a branch of the Nile of Egypt ; or that, when the existence of a great lake, in the direction of the known portion of its stream, became known, the opinion should have followed that the river terminated in that lake, or that it was discharged through the lake into the Nile. Such, consequently, have been the prevalent notions in all ages, even among the most intelligent foreigners, as well as the highest class of natives,—from Herodotus, Etearchus, and Juba, to Ibn Batuta, and Bello of Sakkatú.

Considering these circumstances, it will hardly be contended that the late discovery has made any alteration in the nature of the question as to the identity of the Quorra and Nigir,—the sudden bend of the river to the southward, through a country which has been equally unknown to ancients and moderns, having always left the best informed of them in ignorance of any part of the river, except that of which the course was northerly or easterly. If, then, there is sufficient reason for the belief that these latter portions were known to the ancients, we have only to suppose them to have had some such imperfect knowledge of the interior of North-Africa, as we ourselves had attained previously to the expedition of Denham and Clapperton, to justify the application of the name Nigir to the whole course of the river. It remains to inquire whether they had that degree of knowledge.

The only passage in history, more ancient than the time of the Roman empire, from which an inference can be drawn that the Quorra was then known, is the description given by Herodotus

* Leo had been at Timbuktú, and had therefore seen the river ; but he was very young at the time, and his memory probably failed him when he wrote his book many years afterwards in Italy.

of a very remarkable journey of discovery, undertaken, in his time, by some of the Nasamōnes, a Libyan people, who occupied the country lying between that of the Garamantes, or the modern Fezzán, and the great bay of Syrtis, and who appear to have held also the Oasis of Augila in their dependence.* Some of the sons of the chief men of the tribe having formed an association for the purpose of discovering new countries in the Libyan desert, five of them, chosen by lot, and furnished with every requisite, set out on this perilous enterprise. After having passed through the οἰκομένην, or inhabited region, and the θηριώδους, or country of wild beasts, which lay beyond it, they traversed, during many days, the great sandy desert† towards the west,‡ until they arrived in a country inhabited by men of a low stature,§ who conducted them through extensive marshes|| to a city, built on a great river, which produced crocodiles, and which flowed towards the rising sun.¶

That there can be no casual error in the direction here ascribed to the current of the river, is proved by the historian's opinion, that it was a branch of the Nile, in which he coincided with Etearchus, king of the Ammonii, from whom, through the medium of the Greeks of Cyrene, his information on the Nasamonian expedition was derived.** It is equally evident that the country, visited by the Nasamōnes, could not have been near the maritime provinces, afterwards called Africa and Mauritania, for Herodotus expressly describes the οἰκομένην, or inhabited country, as that which stretched along the Mediterranean from Egypt, as far as Cape Soloeis, now Blanco, thus comprehending all modern Barbary, and which, where not occupied by Greek or Phœnician colonies, was then inhabited by Libyans. The country of the wild beasts lay inland from the inhabited belt, and the desert was beyond the latter, so that it is impossible that the river discovered by the Nasamōnes could have been one of those lying on the southern side of the kingdom of Algiers, as in that case they would not have crossed any desert, and their most convenient route, for half the distance, would have been along the sea-coast.

That Herodotus could not have intended any but a part of the Sáhara, or Great Western Desert, as that which he believed the Nasamōnes to have crossed, seems evident from his forcible and accurate description of it,†† and from his similar description of the

* Herodot. l. ii. c. 32.—l. iv. c. 172, 173, 175.—v. et Plin. l. v. c. 5—Strabo, p. 836.

† τὴν ἔρημον χώρον πολλὸν ψαμμάδεια. ‡ πρὸς ζέφυρον ἀνεμὸν.

§ μισθρίων ἐλάσσονας ἀνδρῶν. || δι' ἐλπίων μεγίστων.

¶ ἀπὸ ἐσπέρας πρὸς ἥλιον ἀνατέλλοντα.

** It appears from the name of Etearchus, that the Greeks at that time possessed Ammonia.

†† Ὅτι δὲ τῆς ὀφρύνος ταύτης, τὸ πρὸς νότον καὶ μεσόγειαν τῆς Λιβύης, ἐρήμος καὶ ἀνδρὸς καὶ ἀθῆρος καὶ ἀνομήρους καὶ ἄξυλός ἐστι ἡ χώρα καὶ ἰκμάδος ἐστὶ ἐν αὐτῇ οὐδέν.—Herodot. l. iv. c. 185.

Desert passed by the Nasamōnes. His account of the route from Thebes by the Oases of Ammon and Augila to Garamantia, and his notice of salt-mines beyond the latter country, are undoubted proofs that the Libyans, from whom he derived this knowledge, had given him a tolerably correct idea of the interior of North Africa between Egypt and the Sáhara, so that there wanted only such a discovery as that of the Nasamōnes to make him acquainted with the existence of the Quorra. That the Nasamōnes were exactly one of the people most likely to have undertaken such an enterprise as the historian describes, will appear on considering the position of their country in the centre of the northern coast of Africa, where a deep bay forms the beginning of the shortest line of communication with the centre of Æthiopia, and which is also the easiest, as there occur upon it no great intervals of waterless desert. Thus situated, the Nasamōnes were, together with their southerly neighbours, the Garamantes, naturally engaged as the principal carriers of that commerce by which the Carthaginians supplied themselves with slaves, elephants, gold, ivory, ebony, and other commodities, as well for home consumption as for the export trade of that opulent and powerful republic with the shores of the Mediterranean. The Nasamōnes having thus inevitably obtained a knowledge of a great part of the direct road into Æthiopia, it was natural that some of the most adventurous among them should explore the countries to the westward of that line, and undertake an enterprise by which they proposed, as Herodotus states, to exceed all their former exploits of the same kind.*

It is probable, therefore, that the inhabited country from whence the Nasamōnes took their departure, was that of Fezzán, which immediately bordered on their own, and that their route through the *Θηριώδης* was not very different, for a considerable distance, from that of Denham and Clapperton. From Bilma, or some of the Oases to the westward of that country, a course not more southerly than W.S.W., would have carried them to a part of the Djolibá, or Quorra, where, after having for a great distance flowed to the north, it has an easterly course, and where the marshes which they crossed may have been some inundation or enlargement which may then have existed, and may, perhaps, as that part of the stream remains to be examined, still exist: we learn from Park and Caillié how very subject the plains adjacent to the Quorra are to such inundations. That the Nasamōnes really reached this river, is strongly argued by the fact that the Quorra not only agrees with the data of Herodotus, but is the only river in North Africa that does so agree in its magnitude, in

* --- ἀνδρῶν δυναστῶν παῖδας ὑβριστάς· τοὺς ἄλλα τε μηχανᾶσθαι ἀνδρωθέντας περισσὰ καὶ δὴ καὶ ἀποκλῆρῶσαι πέντε ἰουστῶν ὀφρμένους τὰ ἔρημα τῆς Λιβύης καὶ εἴ τι πλῆον ἴδοιεν τῶν τὰ μακρότατα ἰδομένων.—Herodot. l. ii. c. 32.

the abundance of crocodiles which it produces, and in its flowing from west to east through a country inhabited by black men.

As to the direction of the Nasamōnes across the desert, described by the words *πρὸς ζέφυρον ἄνεμον*, it may be observed, that they are far from conveying the precision of a modern compass bearing, and may have been purposely used by the historian in an approximative sense; or, supposing this not to have been his meaning, that almost every ancient author from Homer downwards, and none more than the *geographer* Strabo, furnishes instances of the inaccuracy of the ancients in regard to bearings. In any case a route more westerly than that which I have just mentioned is not admissible, if we suppose Herodotus to have intended a due easterly course, or thereabouts, in stating the river to have flowed from the west to the rising sun, since it is evident that the direction of the route of the Nasamōnes was not coincident with the course of the river, but a line which intersected it.

There may be some difficulty in imagining that five young men could have crossed a desert of more than 600 miles, and have returned in safety, in the manner described by the historian; but to Libyans—practised in the art of crossing deserts—this may not have appeared so tremendous an operation as it does to us; and although, in the supposed direction of the discoverers, there are immense tracts meriting the historian's character of 'terribly deficient in water';* there are also, according to the best information, several spots on the 'leopard's skin'† between Fezzán or Bilma and the Quorra, containing both water and inhabitants. M. Walckenaer supposes that the story may have been an invention of the five Nasamōnes themselves, who, having penetrated into one of the Oases, may there have obtained some real information of the Quorra. But, even in that case, we must conclude that a knowledge of the existence of the river had reached the coast of the Mediterranean in the time of Herodotus. Although it was not in Egypt, but in Cyrene, that the historian made this addition to his stock of information, it is hardly credible that the Egyptians, under the Pharaohs, whose dominions extended southward into the belt of country fertilized by the tropical rains, and who had thus an access uninterrupted by extensive deserts to the whole series of countries forming the modern Bilad-es-Sudán, should not have known the existence of the Quorra. Extant monuments give the greatest reason to believe that some of the Pharaohs carried their conquering arms to a considerable extent

* Τὰ δὲ κατ' ἄπτερε τῆς θηριωδίας, ψάμμος τί ἐστι ἀνδρὸς δεινῶς καὶ ἐρῆμος πάντων.—Herodot. l. xxi. c. 32.

† Ἐστὶ δ' (ἡ Λιβύη) ὥσπερ οἱ τε ἄλλοι δόλοῦσι καὶ δὴ καὶ Γναῖος Πείσω, ἡγεμὼν τῆς χώρας, διηγείτο ἡμῖν, ἰσχυρὰ παραδελῶ, κατὰ στικτος γὰρ ἐστὶν οἰκῆσαι περιεχομέναις ἐρήμῳ καὶ ἀνύδρῳ γῇ καλοῦσι δὲ τὰς τοιαύτας οἰκῆσεις Ἀνάσεις οἱ Αἰγυπτῖοι.—Strabo, p. 130.

in these countries, and a great commercial intercourse with them seems an inevitable effect of the advanced state of society and the arts, which prevailed in Egypt during so many ages.

Admitting, however, all these to be matters of conjecture, which can never be thoroughly determined unless the Egyptian hieroglyphics, or some of the lost literature of Greece or Carthage should throw an unexpected light on the subject, I proceed to inquire how much of the interior of North Africa was known when the Romans were not only masters of all the fertile belt bordering on the Mediterranean, but had established colonies or garrisons in several of the districts insulated by the Great Desert? It must be admitted that, as late as the reign of Tiberius, this knowledge was not very great; it would seem, at least, that whatever information on the subject may have existed among the Carthaginians, or the Greeks of Egypt or Cyrene, it had not found its way into the works of the Greeks whom Strabo consulted in the compilation of his geography: Strabo, indeed, was not ignorant that an immense region, inhabited by black men,—for such is the meaning which the ancients constantly attached to the word *Æthiopia*,—extended from the southern frontier of Egypt, and the peninsula of Meroe,* to the Atlantic Ocean westward; but of the details of that country no certain knowledge had reached him, as he shows by citing the opposite testimonies of two of his principal authorities as to the rivers of Libya, Posidonius having asserted that they were few and small, and Artemidorus that they were great and numerous.†

But the frequent necessity of chastising the lawless tribes of the Libyan deserts inevitably led the Romans to further conquests, settlements, and discoveries; and existing monuments prove not only that Mauritania, Numidia, Cyrene, and Egypt enjoyed great prosperity under their protection during the three first centuries of the empire, but that their advanced posts were extended into Nubia, the Oases, and Fezzán. In the year 19 of the Christian era, Cornelius Balbus triumphed at Rome for his conquest of the Garamantes; and among numerous places of which representative images were carried in the procession, were those of Phasania, Garama, and Cydamus,‡ all which names still exist, or, at least, with little alteration. In the year 41 Suetonius Paullinus, afterwards Consul, was the first of the Romans who led an army across Mount Atlas. At the end of a ten days' march he reached the summit,—which even in summer was covered with snow,—and from thence, after passing a desert of black sand and burnt rocks, he arrived at a river called Ger;

* Strabo, p. 821.

† *Ibid.*, p. 830.

‡ *Plin. H. N.* l. v., c. 5.

he then penetrated into the country of the Canarii and Perorsi, the former of whom inhabited a woody region abounding in elephants and serpents, and the latter were Æthiopians, not far distant from the Pharusii and the river Daras.*

But the two most remarkable Roman expeditions, and which indicate a great progress in military enterprise and the geographical discovery arising from it, are those of Septimius Flaccus and Julius Maternus, which, although of uncertain date, and resting only on the authority of Marinus of Tyre, as cited by Ptolemy,† are curiously illustrated by the discoveries of Horne-
mann, Lyon, Denham, and Clapperton. Of Flaccus it is related only, that he was an officer serving in Libya, and that he accomplished a three months' march from the country of the Garamantes into that of the Æthiopians. Maternus, being at Leptis Magna, (now Lébeda near Tripoli,) proceeded from thence to accompany an expedition sent by the king of the Garamantes against his rebellious subjects in Æthiopia, on which occasion, after a march of four months from Leptis, Maternus arrived at Agisymba. In both instances, the direction of the route is stated to have been south.

Now a four months' march from Lébeda on the meridian of that place, at the mean rate of the march of armies, which Rennell deduced from a great number of examples to be 10.6 G. M. on the horizontal line, reaches exactly to the southern side of the lake Tjad, so that there is every probability that Maternus penetrated to that country, and that Bornú is the ancient Agisymba. It is true, that the only characteristic of Agisymba, mentioned by Ptolemy, namely, that it abounded in the rhinoceros, does not accord with the information of Denham, who has not included the rhinoceros among the animals found in Bornú; but as the abundance of the wild animals in any particular place depends upon the human race, and as the horn of the rhinoceros has long been a valuable object of commerce, the animal may now be driven into some more secure retreat. It is sufficient to observe, in support of the opinion, that Maternus really penetrated as far as Bornú; that the rhinoceros is an animal which frequents woods and marshy places, and consumes a great quantity of water, and, consequently, that it could never have been an inhabitant of any of the countries included within the desert belt of Libya.

If the bearing of the march of Flaccus was exactly the same as that of Maternus, his three months' journey would have carried him nearly to the same point as the four months' march of Maternus; for Gárama, from which the Garamantes took their name, and of which some remains are still to be seen not far from Morzúk in Fezzán, is between one-fourth and one-third of the distance from

* Plin. H. N. l. v., c. 1.

† Ptolem. l. i., c. 8.

Lébeda to Bornú, on the same meridian: but, possibly, the direction of Flaccus differed a little, so as to have led him not to Bornú, but to some part of the country a little eastward or westward of the lake Tjad. There is great reason to believe, from the words of Ptolemy, which seem to be those of Marinus himself, that the road into Æthiopia by Gárama was, as I have before hinted, a frequented commercial track, as it is at the present day. Another remarkable resemblance between the modern condition of those countries and that which existed at the time of the expedition of Maternus is found in the subjection, at that time, of a part of Æthiopia to the Garamantes of Fezzán, who were themselves under the control of the Romans on the Mediterranean coast. In like manner, or nearly so, both Fezzán and Bornú, when Denham travelled, were considered dependant on the Pashá of Tripoli.

The conquest of a part of Æthiopia by the Garamantes accords with the allusions which we find in Roman history and poetry to the great power of that people, who were extended by conquest far beyond the limits of Fezzán, and would even seem, from one of the positions in Ptolemy, to have comprehended the modern Waday, and to have conquered as far as latitude 10° N., where a mountain was known by the name of ἡ Γαραμαντικὴ φάραγξ, or the Garamantic ravine.* Ptolemy appears not to have paid attention to this great extension of the Garamantes by conquest in a south-eastern direction, when he accused the two Romans of incorrectness in the bearings and distances of their marches; in support of which opinion he asserts, that there was not so great an interval as a three months' journey between the Garamantes and Æthiopians, and that, in fact, the Garamantes were themselves a people of Æthiopia;† for if we apply this remark to the Garamantes of Gárama, which Ptolemy places in lat. $21\frac{1}{2}$, it is directly at variance with another passage, wherein the geographer observes that in the northern tropic men of the Æthiopian colour were not found so far north as the boundary of the tropic, but that about Meroe, in lat. $16\frac{1}{2}$, they began to be black, and elephants and rhinocerotes began to be seen,‡ which exactly accords with modern observations. There seems no mode, therefore, of reconciling the geographer with himself, but by imputing to him some negligence in the distinction between Proper and Acquired Garamantia.

I have little doubt that Ptolemy's latitude of Garama was deduced from the computation of Flaccus and Maternus,§ who had reckoned 5400 stades from Leptis to Garama, for this exactly agrees with Ptolemy's distance between the two places, at his own

* Ptolem. l. iv., c. 6.

‡ Ptolem. l. i., c. 9.

† Ibid. l. i., c. 8.

§ Ibid. l. i., c. 10.

rate of 500 stades to the degree. By trusting to this computation, which, as so often happens in similar cases, was very exaggerated, he was misled 5° in the latitude of Garama, the real latitude being $26\frac{1}{2}$, and this error he committed at the same time that he refused to trust to the far better geographical evidence of the number of days' march between Leptis and Agisymba. As to the extravagant southerly position which he gives to the latter place, namely, 16° south, it may perhaps be accounted for by the great southerly extension of the Garamantic name, which may have led him to calculate the difference of latitude from the southern part of Acquired Garamantia instead of from Garama. It is evident, at least, that if the expedition of Maternus was a reality, and was truly reported by Marinus, of which there is no reason to doubt, Ptolemy's position of Agisymba cannot have been near the truth.

In this and many other instances, Ptolemy had probably computed his positions from the vague reports of ignorant men; and of his work in general we may say, perhaps, that it was too ambitious an attempt for ancient science, tables of positions by longitude and latitude being the perfection of geography, and which cannot be free from numerous errors, until geography is in a much more advanced state than the imperfect means of the ancients admitted. In many places, moreover, the text of Ptolemy is evidently corrupt: nevertheless, it is from him alone that we can estimate the extent of the geographical knowledge of North Africa obtained by the ancients. His work, like maps and geographical books in general, was, as he himself informs us, an improvement upon the latest, namely, that of Marinus, whose superiority in diligence and learning to all his predecessors Ptolemy fully admits, while subjecting him to a severe criticism. But Ptolemy had an advantage over Marinus in residing in a city, which, for near five centuries, had been the principal seat of science in the ancient world. He had at his command the famous library, in which was probably to be found all that the Greeks of Egypt had ever known of African geography, as well as all that the arms and commerce of Rome may have disclosed; and as science began rapidly to decline soon after the time of Ptolemy, his work may be supposed to contain the result of all that the ancients ever knew upon the subject.

In order to show the extent of his information on the interior of North Africa, I shall here subjoin a translation of a part of the sixth chapter of his fourth book; and, in order to allow of an easy comparison of its results with our own geographical knowledge of the same country, I have inserted on the most recent map the course of the rivers and the positions of the towns and mountains noticed by Ptolemy, according to his latitudes and longitudes, taking only his differences of longitude without reference to his

first meridian, and as he has made the breadth of North Africa between the western coast and the Nile too great by 5° , I have endeavoured to lessen the effect of the error by measuring all his longitudes in the eastern half of the continent from the meridian of Alexandria, and all those in the western half from that of Cape Arsinarium, which I assume with Rennell to have been the present Cabo Verde, and with the more confidence, as we find that Ptolemy's difference of longitude between Arsinarium and Carthage is very nearly correct according to that assumption.

'Interior Libya,' says Ptolemy, 'is bounded on the north by the two Mauritaniae, by Africa, and by the Cyrenaica,—on the east by Marmarica, and by the Æthiopia which lies above Egypt, —and on the south by Interior Æthiopia, in which is Agisymba. The eastern extremity of the latter boundary is in E. long. 51.15° and S. lat. 3° (6), and its western end at the Hesperian, or great gulf of the exterior sea in long. 14° , lat. 4° *. On the west, the boundary is the Western Ocean from the Hesperian Gulf to the frontier of Mauritania Tingitana.' In this sea-coast, to the southward of Tingitana, are the following positions : †

	E. Long.	N. Lat.
Mouth of the Subus.....	9. 0	25
Mouth of the Salathus.....	9.20	22
Mouth of the Chusaris.....	10. 0	21.40
Mouth of the Nuius.....	10. 0	18.20
Cape Soloeis.....	9.30	17.30
Mouth of the Massa.....	10.30	16.30
Mouth of the Daras.....	10. 0	15. 0
Promontory Arsinarium.....	8. 0	‡13. 0
Promontory Ryssadium.....	8.30	11.30

In the Hesperian Bay.

Mouth of the Stachir, or Trachir.....	9.30	11. 0
Mouth of the Nia.....	13.30	9. 0
Hesperii Ceras.....	13. 0	8. 0
Mouth of the Massitholus.....	14.30	6.20
Hippodrome of Æthiopia.....	14. 0	5.30
The chief mountains of Libya are Mount Mandrus, from whence flow all the streams from Salathus to Massa ;—the middle of the mountain.....		
	14. 0	19. 0
Mount Sagapola, or Salapola, from which flows the Subus ;—middle of the mountain.....		
	13. 0	22. 0

* τὸν Ἑσπέριον μέγαν καλούμενον κόλπον τῆς ἐκτὸς θαλάσσης. In the Latin version the lat. is 5° .

† I have omitted some of the positions as not essential to the inquiry.

‡ 12° Lat. version. There are many variations in the two texts as to *minutes*, which are not worth notice.

	E. Long.	N. Lat.
Mount Ryssadius, from which flows the Stachir, making near it the lake Clonia;—the middle of the mountain (or lake ?).....	17. 0	11. 0
The mountain called the Chariot of the Gods, which gives rise to the Massitholus.....	19. 0	15. 0
Mount Caphas, from which flows the Daratus;—its middle.....	17. 0	10. 0
Mount Usargala, from which flows the Bagradas;—its middle.....	33. 0	20.20
This river flows through Africa into the sea, near.....	34. 0	32.40
Mount Girgiris, in which the Cinyps rises, having one source in.....	40. 0	21. 0
and another in.....	45. 0	21. 0
and their junction at.....	42. 0	25. 0
Mount Thala, the middle of which is at.....	38. 0	10. 0
The mountain called the Γαραμαντική Φάραγξ, or Garamantic ravine.....	50. 0	10. 0
Mount Arvaltes, or Argaltes.....	33. 0	3. 0
Mount Arangas.....	47.30	2. 0
In the interior the two greatest rivers are the Geir and the Nigair.		
The Geir unites Mount Usargula with the Garamantic phar anx. A river* diverges from it at.....	42. 0	16. 0
and makes the Lake Chelónides, of which the middle is in.....	49. 0	20. 0
This river is said to be lost under-ground, and to re-appear, forming another river, of which the western end is at.....	46. 0	16. 0
The eastern part of the river forms the Lake Nuba, the site of which is.....	50. 0	15. 0
The Nigair joins the mountains Mandrus and Thala, and forms the Lake Nigrites, of which the position is.....	15. 0	18. 0
This river has two northerly divergents to the mountains Sagapola and Usargala to the east, one divergent to the Lake Libye, the site of which lake is.....	35. 0	16.30†
and to the south, one divergent to the river Daras, at two positions.....	26	17
and.....	24	17‡

* *ἐκτραπίς ποταμός.*

† *Καὶ πρὸς ἄρκτους ἐκτροπὰς δύο ἐπὶ τε τὸ Σαγαπόλα ὄρος καὶ ἐπὶ τὸ Οὐσάργαλα ὄρος· πρὸς ἀνατολὰς δὲ ἐκτροπὴν μίαν ἐφ' ἧς λίμνην Λιζύνη ἢς Θάσις—λε—ις.* Here it seems necessary to read either *ἐπὶ τὴν*, or *λίμνην Λιζύνη*, in either case the divergent led to the lake Libye.

‡ In the Latin, 21—17, and 21—13.30.

	E. Long.	N. Lat.
In the country above the Nigeir the following cities are dispersed :		
Talubath.....	18. 20	22. 20
Malacath.....	20. 20	20. 15
Tucabath.....	18. 0	19. 30
Bintha.....	20. 15	21. 0
Below the Nigeir.		
Anygath.....	20. 30	14. 0
On the river on its northern side.		
Pessidē.....	19. 0	18. 0
Thige.....	21. 0	17. 30
Cuphe.....	23. 15	18. 0
Nigeira Metropolis.....	25. 20	17. 20
Vilegia.....	28. 30	17. 20
Tagama.....	30. 0	17. 0
Panagra.....	34-16*	16. 20
On the southern bank of the river.		
Thupæ.....	36. 30†	16. 40
Punse.....	18. 0	17. 0
Saluce.....	19. 30	17. 0
Thamondocana.....	23. 0	17. 0
Dudum.....	31. 0	15. 0
Below the river Geir.		
Geira Metropolis.....	36. 0	18. 0
Upon the river to the north.		
Thycimath or Ucymath.....	38. 0	19. 20
Gēua.....	39. 0	19. 0
Badiath.....	40. 0	17. 0
Ischerei.....	41. 30	16. 30
Tucrumuda.....	41. 30	15. 30
Thuspa or Thuppa.....	43. 0	17. 20
Artageira.....	44. 0	18. 0
Rubune.....	46. 0	19. 0
Lynxama.....	48. 30	20. 0

There are two remarkable expressions in the Greek text of this extract, which it is essential to consider with a view to the exact meaning of the author :—1. ἐκτροπή, which, in the Latin translation, is divertigium, and may be rendered in English by the word divergent. Ptolemy employs it simply to indicate the point of junction of two streams without any reference to the course of their waters. Thus he equally applies it to the point of partition of the branches of the Nile in the Delta, and to the junction of the tributaries which descend into the Danube, as the Tibiscus or

* In the Latin 31—0.

† Ibid, 26—30.

Teiss, and the Aluta or Alt. 2. ἐπιζευγνύων. After having stated that the Gir (Γεῖρ) and Nigir (Νίγειρ) are the two principal rivers of the interior of Libya, he describes the one as ἐπιζευγνύων, uniting or yoking together, the mountain called the Garamantic phar anx with Mount Usargala, and the latter as uniting, in the same manner, Mount Mandrus with Mount Thala. Such a singular description of a river can only have had reference to the circumstance of these waters having been, as he describes them, rivers of the interior, ἐν τῇ μεσσηείῳ, that is to say, rivers beginning and ending in the interior, without any communication with the sea, for such it is evident that he considered both of them to have been. If two opposite branches of a river, rising in two very distant mountains, flow to a common receptacle, the whole may be described as joining the two mountains. To the forks of the several branches of such rivers the word ἐκτροπή was particularly apposite, as it left the author irresponsible as to the course of the water in the branch turning off from the main stream. Sometimes it may even be supposed to leave an uncertainty as to which of them was the main stream.

We are not yet sufficiently acquainted with the Quorra to identify any of its ἐκτροπαί, or divergents; and even when we have sufficient data to institute the comparison, the imperfection of the information upon which Ptolemy founded his positions will, probably, still leave those particulars in obscurity. It may be fairly presumed, however, that the ἐκτροπαί to the mountains Sagapola and Usargala were two ascending divergents or tributaries flowing into the Quorra from the mountains which lie to the northward of it, and that the southerly divergent was a similar branch from that quarter, Ptolemy having, perhaps, mistaken its origin in the same mountain, which gives rise to the Daras, for a communication with that river. Of the general direction of the current of Ptolemy's Nigir there can be no doubt, since the latitudes and longitudes of the several towns on its banks prove a general bearing of east and west; while the description of it as a river of the interior, confirmed by the fact of his not having named it among the rivers which join the western coast, leave the inevitable consequence that he supposed it to flow from west to east.

The Lake Libye, to which there was an easterly divergent, I strongly suspect to have been the Lake Tjad, notwithstanding that the position of Libye falls 300 c. m. north-westward of this lake, for the name Libye favours the presumption, that it was the principal lake in the interior of Libya; it was very natural that Ptolemy, like many of the moderns, should have been misinformed as to the communication of the river with that lake, and that he should have mistaken two rivers flowing from the same ridge in opposite directions to the Quorra and to the Tjad, (I

allude to the Sakkatú river and the Yéu,) for a single communication from the Quorra to the lake.

We now know, indeed, that the river does not communicate with the Tjad; that it is not a river of the interior, in Ptolemy's sense; that its sources are in a very different latitude from that which he has given, and its course very different from that enormous extent of easterly direction which results from his positions of the towns on its banks. But we have very recently obtained this knowledge, and it is nevertheless remarkable, that the difference of longitude between his source of the river and the western coast is the same as that given by modern observations,—that Thamondocana, one of the towns on his Nigir, is exactly coincident with Timbuktú, as recently laid down by M. Jomard from the itinerary of M. Caillié,—that the length of the course of the river resulting from Ptolemy's positions is nearly equal to that of the Quorra, as far as the mountains of Kong, with the addition of the Shadda or Shary of Funda; and that his position of Mount Thala, at the south-eastern extremity of the Nigir, is very near that in which we may suppose the Shadda to have its origin. So that it would seem as if Ptolemy, like Bello and other modern Africans, had considered the Shadda as a continuation of the main river, though he knew the Egyptian Nile too well to fall into the modern error of supposing the Nigir to be a branch of the Nile. The mountains of Kong, and the passage of the river through them at right angles to their direction, formed a natural termination to the extent of the geographer's knowledge, in like manner as among ourselves the presumed and at length the ascertained existence of those mountains has been the chief obstacle to a belief, that the river terminated in the Atlantic.

The preceding attempt to show, that Ptolemy's information on the Djolibá or Quorra, although extremely imperfect, was real, will not appear superfluous when it is considered, that the celebrated French geographer, M. Gosselin, came to the conclusion, that the ancients possessed no knowledge of North-western Africa southward of the river Nun,* and that M. Walckenaer sums up the result of his learned researches in the following words:—' Il est démontré d'après tout ce que nous avons dit, que le Nigir et le Gir, tracés sur la carte de Ptolémée, ' n'appartiennent pas au Soudan, mais aux contrées qui sont immédiatement au sud de l'Atlas, et qu'on ne peut tirer aucune

* In the work of M. Gosselin, entitled, '*Recherches sur la Géographie systématique et positive des Anciens*,' and in the twenty-sixth section of the *Geographical System of Herodotus* by Rennell, will be found the opposite arguments on the question of the degree of knowledge of the western coast obtained by the ancients, and particularly on the Periplus of Hanno.

‘ lumière de ce géographe, ni d’aucun autre auteur ancien, pour
‘ ce qui concerne le Joliba ou Niger, ou les autres rivières du
‘ Soudan, puisque cette région a été inconnue à toute l’antiquité,
‘ et fut réellement une découverte des Arabes.’

The principal grounds of this opinion are,—1. That, according to Strabo, the *Nigritæ* and *Pharusii*, who were said to have destroyed the Tyrian settlements on the coast of the Atlantic, and who were adjacent to the western *Æthiopians*, were distant only thirty journies from *Linx* or *Lixus*, now *El Araïsh*, on the western coast of Marocco, not far to the southward of Cape Spartel. 2. That Pliny places the same *Pharusii* near the *Canarii* and *Perorsi*, who were subdued by Suetonius Paullinus, when, soon after having crossed Mount Atlas, he arrived at the river *Ger*, (in some MSS. *Niger*.) 3. That Ptolemy also places the *Nigritæ*, *Perorsi* and *Pharusii* in the vicinity of one another, and the *Nigritæ* on the northern side of the *Nigir*, from which they took their name,—consequently that the *Niγειρ* of Ptolemy was the same as the *Ger* of Pliny; and the latter having been only a few miles from Mount Atlas, and the *Nigritæ* and *Pharusii* only thirty journies from *Lixus*, that the *Nigir*, and the several people just named, were all on the northern side of the Great Desert. 4. That in like manner the conquests of Cornelius Balbus did not extend beyond *Ghadâmes*, *Fezzân*, and *Kawwâr*, Pliny having had no knowledge of any country farther to the south, except that of the *Blemmyes*, or people of *Bilma*, whom he knew only by name, as appears evident from his representing them as wearing their faces upon their breasts.

Now, it may be readily admitted that Strabo had no knowledge, or at least that he placed no confidence in any information which may have reached him as to the countries more southerly than *Fezzân*, since he remarks of those situated beyond *Garamantia*, the Oases of Egypt, and the Ammonian Oasis, that ‘ numerous
‘ intervening deserts prevented any exact knowledge of them from
‘ being obtained, and consequently that he could not state what
‘ were the boundaries of *Æthiopia* and *Libya*, even in the parts
‘ adjacent to Egypt, still less in regard to the *Æthiopians* who
‘ bordered upon the ocean.’* But if he was so ignorant of *Libya*, and particularly of the position of the Western *Æthiopians*, of what validity is his testimony that the *Nigritæ* and *Pharusii*, whom he expressly states to have been near those *Æthiopians*, were only thirty journies distant from *Lixus*, particularly as he accompanies the remark with the doubtful word *φασι*, and with an incredible account of the productions of *Mauritania*, such as weazles as large as cats, leeches ten feet long, and, among other animals, the crocodile,† which there can scarcely be any river of

* Strabo, p. 839.

† Ibid. p. 826.

Marocco capable of nourishing, even if the climate were adapted to it? * In another place, Strabo shows that the Pharusii had a great desert between them and Mauritania, which caused the intercourse to be rare, and which the Pharusii crossed, like the natives of the present day, with bags of water suspended under the bellies of the horses.† It is evident that there is a contradiction in these two accounts, and that the latter cannot apply to any place near the sea-coast, at a distance of thirty days from El Araïsh, because the kingdom of Marocco and the ridges of Atlas extend further than that distance. As to the river Ger, which Paullinus reached after crossing Mount Atlas, and a desert of black sand and burnt rocks, it appears to have been either the Darha or the Nun; for Pliny shows the latter river to have been in, or very near, the country of the Canarii, who dwelt opposite the *Μακάρων Νήσοι*, or Fortunate Islands, one of which was called Canaria,‡ and has given the collective modern name to them all.

The Nigris of Pliny was obviously a very different river, both in its nature and position, from the Ger of the same author. It was situated to the southward of the great desert, on the line separating Africa from Æthiopia; and its magnitude and productions, but more particularly the period of its greatest fulness, cannot possibly be made to correspond to any of the inconsiderable rivers which descend from Mount Atlas. Those streams may perhaps produce the calamus and papyrus, but it is very improbable that the hippopotamus was ever a native of any of them, or even the crocodile; and it is certain that they do not swell at the same season as the Nile of Egypt, being fed, not by tropical rains, falling in greatest quantity near the summer solstice, but by the waters of the maritime ridges, which are most abundant in winter.§

Setting aside, then, the thirty journeys of Strabo between Lixus and the Pharusii, as an error either of his information or of the text, which latter is not improbable, as numbers in MSS. are

* In Egypt, where the average heat is equal to that of Senegambia, the crocodile is seldom seen so low as Siont.

Pliny, l. viii. c. 1, 11. agrees with Strabo in asserting that Mauritania produced elephants. As the whole of Barbary is more European than African in its climate and productions, it may be doubted whether the elephant, which is no longer found there, was ever indigenous, though it may have been naturalized by the Carthaginians, to whom elephants were of importance as a part of their military establishment. Appian informs us (de R. Pun. c. 9.), that when preparing for their last war with the Romans, they sent one of their leading men—Asdrubal, son of Gisco—to hunt elephants, *ἐπὶ θήραν ἐλεφάντων ἐξέστειλον*. It is not to be imagined that Gisco went into Æthiopia for this purpose, as he could not, in that case, have executed his mission in less than six months.

† Strabo, p. 828.

‡ Ibid. p. 3, 150.—Plin. H. N. l. vi. c. 32.

§ Nigri fluvio eadem natura quæ Nilo; calamum et papyrus et easdem gignit animantes, iisdemque temporibus augecit. Plin. l. 5, c. 8.

so often corrupt, we shall find that Strabo, Pliny, and Ptolemy, are in perfect agreement with one another as to the situation of the several people of the western part of North-Africa. The Gætuli, whom Strabo describes as the greatest of the Libyan nations, occupied the whole of that vast tract of country called Bilad-ul-jerîd, which extends from the Garamantes, now Fezzân, to the south-western extremity of Mount Atlas, where they bordered upon the Maurusii.* The ridges of Atlas bounded them on the north, and the great deserts on the south. The Canarii, as I before hinted, occupied the country opposite to the Canary Islands. The Perorsi inhabited a few fertile spots spread over a long extent of maritime country between the Canarii and the Pharusii, the latter of whom occupied the banks of the Senegal, and were bordered towards the interior by the Nigritæ, dwelling between the river Nigris and the great desert.†

As to the account of the Nile and Nigir, which Pliny received from the second Juba of Numidia, it is derived from that absurd notion on the identity of all the waters of North-Africa, which has been prevalent in that country in all ages, and it only proves the low state of geographical science at Rome, as well as the ignorance and credulity of the African prince, notwithstanding his reputation for learning.‡ He reported that the Nile had its origin in a mountain of Lower Mauritania, not far from the Ocean, in a stagnant lake called Nilis,—that it flowed from thence through sandy deserts, in which it was concealed for several days,—that it reappeared in a great lake in Mauritania Cæsariensis,—that it was again hidden for twenty days in deserts,—and that it rose again in the sources of the Nigris, which river, after having separated Africa from Æthiopia, and then flowed through the middle of Æthiopia, at length became the branch of the Nile, called Astapus. The same fable, though without any mention of the Nigir, is alluded to by other authors;§ and as one of them adds,|| that the river, at its source, was called Dara, that which flows through the country, still called El Darha, from Mount Atlas into the Desert, would seem to be the stream which had the honour of being the reputed commencement of the Nile.

As it is obvious that if the Nigir of Ptolemy was one of the rivers at the foot of Mount Atlas, he has assigned to it a latitude at least 12° more southerly than the reality, it may be right to consider what probability there is of his having been guilty of this error.

* Strabo, pp. 826, 829, 835, 838.

† Plin. l. 5, c. 8.—Ptolem. l. 4, c. 6.—Strabo, pp. 131, 826, 828.

‡ Studiorum claritate memorabilior etiam quam regno. Plin. l. 5, c. 1.

§ Vitruv. l. 8, c. 2.—Æthici Cosmog.—Strabo, p. 826.

|| Mela de Situ orbis, l. 3, c. 9.

In favour of the supposition, it may be alleged, that in referring to his positions on the branches of the Nile, we find that the lake Coloe, assuming it to be the same as the Dembea of Abyssinia, is just 12° to the south of the true latitude, as observed by Bruce, that the sources of Ptolemy's Nilus (the Bahr-el-Abiad) are about the same distance beyond their probable situation: that Carthage is $4\frac{1}{2}^{\circ}$,* and Garama 5° to the southward of their real latitude, and Agisymba, if I am right in the inference drawn from the march of Maternus, not less than 25° to the southward of its true position. All these undoubtedly tend to justify a belief of an erroneous southerly extension throughout the interior of North Africa, and render more probable, therefore, the error in Ptolemy's position of the Nigir. On the other hand, we find that his latitude of the city of Meroe is true within half a degree, when applied to the ruins near Shendy, while the difference between its meridian and that of Alexandria is not more than 2° or 3° in defect, according to the best modern observations, which may not themselves be quite correct. His difference of longitude between Arsinarium and Carthage is exact to within half a degree;—the 'great gulf of the exterior sea,' as he calls the Gulf of Guinea, is truly described by him as beginning at the latitude of 4° or 5° north; and although he places Arsinarium 2° too far to the south, the differences of latitude and longitude, and the order of the rivers and capes, can leave no doubt that the ancient Soloeis, or Solventia, was Cape Blanco,—the river Daras, or Daratus, the Senegal,—the river Stachir, or Trachir, the Gambia,—and the river Nia the Rio Grande.† And thus the arguments in favour of the identity of Ptolemy's Nigir with the Quorra may be succinctly stated as follows:—He believed that the earth was spherical; he divided the great circle into 360° ; of these degrees he placed the same number in the breadth of North Africa that modern observations confirm;—in the length of the same country he erred only one-tenth in excess. And in the interior, proceeding from a point of the western coast, where his positions approximate to modern geography, he placed a great river, flowing from west to east, exactly in the latitude where the Quorra flows in that direction.

But still, perhaps, it may be alleged, that although Ptolemy may have been tolerably well informed as to the outline of North Africa, he may have been quite ignorant of the interior, and that the coinci-

* As it is very difficult to conceive that the relative longitude of Carthage, with reference to the two extremities of North Africa, should have been better known than its latitude,—or that the latter should not have been as well known as that of Alexandria or Leptis, and the Syrtis, which are correctly given by Ptolemy,—it is possible that there may be a textual error in Ptolemy's latitude of Carthage.

† It seems not at all improbable that the information of Ptolemy on the coast, and, perhaps, also on the interior country, in the same latitudes, was derived from Carthaginian authorities.

dence just mentioned, upon which the question depends, may have been accidental;—it remains, therefore, to be seen what proofs he has given of having approached to a knowledge—for a correct knowledge will hardly be expected—of other parts of the interior. Besides the position of Meroe, already alluded to, we find that he has accurately indicated the three branches of the Nile forming the peninsula called the Island of Meroe, although the situation of the junctions may not bear strict examination; and that, upon the whole, his positions on the Nile, as far as Meroe inclusive, are unquestionably founded upon celestial observations, although beyond that country he has evidently depended upon itineraries and oral description alone, the very common effect of which is erroneous extension by the overrating of computed distances. A similar result from Ptolemy's positions is observable in all the countries which were least known to civilized antiquity; and it is undoubtedly to the same cause that we must attribute the great easterly error, which so long prevailed among the moderns, regarding the longitude of Timbuktú, that longitude having been assumed from itineraries beginning in the western coast.

Can the same cause have induced Ptolemy to place the *Nigir* 12° to the southward of its real latitude? It is difficult to believe so, since although an error in the relative longitudes of Arsinarium, now Cabo Verde, and Cape Κώτεις, or Cotta, now Spartel, which is placed 2° to the westward instead of 13° to the eastward of the former promontory,* have given in Ptolemy's map a false outline to the whole of the north-western extremity of Africa,† the latitudes of most of the places on this coast which can be identified, and even some of the differences of longitude, approximate to the reality sufficiently, at least, to show the extreme improbability of his information on the interior having been so erroneous as to cause him to represent one of the small streams, which have a course of one or two hundred miles from Atlas into the desert, chiefly in a southerly direction,‡ as a great river having a course of more than a thousand miles from west to east. Another strong reason for thinking that Ptolemy could never have been guilty of such a capital error, is, that he connects his *Nigir* with the river Daras, which flowed into the sea in latitude 15° N. and 2° to

* Πρόπους ἔκκεταί τις ὕστατος πρὸς δυσὶν τῆς Μαυρουσίας αἱ Κώτεις λεγομέναι, &c.—Strabo p. 825. Ptolem. l. 4, c. 1. Cotta—Plin. l. 5, c. 1—l. 32, c. 2.

† A delineation formed from Ptolemy's positions may be seen in Rennell's Geography of Herodotus, section 26.

‡ According to the scanty notices which we have of the country on the southern side of the range of Atlas, there is a river in each of the districts of Darha, Tafilet, and Sidjilmassa, in the kingdom of Morocco, and in that of Algiers the Wady Djeddi, which Shaw supposed to be the Ger visited by Suetonius Paullinus. Caillié, who passed through the middle of Tafilet, mentions only a rivulet; and as all that country partakes of the dryness of the Bilad ul jerid, it is probable that none of its rivers are large.

the east of Cape Arsinarium, as well as with Mount Mandrus, from which flowed the Massa, which joined the sea not far to the northward of the Daras.

Again, if we compare Ptolemy's description of the central part of Æthiopia, or that lying between the Nile and the Nigir, with modern discoveries, we find reasons for concluding that he had acquired an obscure knowledge of it similar to that which he had obtained as to the countries near the Nigir, and similar also to that which had reached modern Europe prior to the discoveries of Denham and Clapperton. The principal river of central Æthiopia was the Γείρ, or Gir, which Ptolemy describes as uniting (ἐπιζευγνύων) the mountain Usargala with that called the Garamantic pharanx. As the former lay to the north-west of the latter, and the river in its progress had divergents which formed lakes lying to the northward of the Garamantic pharanx, it is evident that the latter mountain gave rise to the river, and that its general course was from S. E. to N. W. In this important particular, therefore, the Gir agrees with the Shary of Bornú: but it agrees also with another great stream, the existence of which can no longer be doubted, called Misselád by Browne, and Om Teymám by Burckhardt.

As the Garamantic pharanx falls nearly in the longitude and latitude (perhaps a little more northerly) of the probable situation of the sources of the Om Teymám, there is a presumption that this river, rather than the Shary, was the Gir of Ptolemy; and this presumption is supported by the name Djyr;—in fact, the identical name of Ptolemy which, according to Burckhardt, is attached to a country on the banks of the Om Teymám and to the river itself, Om Teymám being the Arabic and Djyr the indigenous appellation. Burckhardt adds that the country produces ebony, which agrees exactly with one of the attributes given to the Gir by Claudian, who, as an African, is a good authority on such a question, though, like an African, he has confounded all the rivers of the country with the Nile, and has represented both the Girrhæi and Garamantes as drinking its waters:—

Hunc bibit infrænis Garamas, domitorque ferarum
Girrhæus, qui vasta colit sub rupibus antra,
Qui ramos ebeni, qui dentes vellit eburnos.*

But that Claudian himself was conscious that he was only repeating a fable in these lines of his *Idyllium* on the Nile, is evident from the words in his graver poem on the first consulship of Stilicho, where he represents the Gir as a separate river, rivalling the Nile in magnitude,—

* Claudian. *Idyll.* in *Nilum*, v. 19.

Gir notissimus amnis

Æthiopum, simili mentitus gurgite Nilum.*

It is inconceivable that Claudian should here have alluded to the Ger of Pliny, at the foot of Mount Atlas, at which Paulinus arrived in a few journeys from the maritime part of Mauritania, though it is by no means impossible that he may have intended not the Gir of Ptolemy, but the Nigir; for it must be admitted that, without the other coincidences, the name Djyr would not of itself have been of much weight, being probably a generic word, like Ba, Bahr, Gulbi, Quorra, Gambarú, Tjad, Enzaddi, † Shadda, or Shary, in the present day, and like Nil in all ages as applied to the rivers and other waters of North Africa. Thus the Ger of Pliny near the foot of Mount Atlas, the Gir of Ptolemy in central Æthiopia, and the Nigir itself, are evidently generic words, meaning, probably, river or water. With regard to the Ni, in the composition of the word Nigir, several conjectures may be offered. It may be an article or prefix of the same force as the N', which we find in several names reported by Denham and Caillié, the latter of whom notices a lake called N'gher, near the Senegal, which seems to be exactly the same word as the ancient Nigir. Or Ni may be equivalent to the Niu in the Ba-niu, White River, which, with Ba-lío, or Black River, are, according to an informant of Clapperton at Sakkatú, the names of the two divergents of the Quorra, which form an island below Sego. In this case Nigir would mean White River;—or, finally, Nigir may be Nil-geir, like the Bahr Nil of Egypt, meaning perhaps nothing more than river-river, or water-river.

These remarks are not altogether unnecessary, since more than one celebrated writer has fallen into the error of supposing Niger a Latin word, though the Nigris of Pliny and the Νίγρις of Ptolemy might have undeceived them. The real etymology of the name leads also to an explanation of one cause of the common belief of the Africans, that all the waters of their country flow to the Nile; for those generic words, and particularly that of Nil, appear to have been occasionally applied to them all.

I shall not attempt to identify the lakes Chelonides and Nuba of Ptolemy, which would only be *obscurum per obscurius* as long as our own information on the countries between Bornú and Darfúr is so extremely imperfect,—still less to explain what he meant by the Bagradas and Cinyps, two rivers bearing the same name as two others flowing into the Mediterranean, but which he distinguishes from the latter by giving the names and positions of the

* Claudian in Pr. Consul. Stilich. lib. 1, v. 252.

† The name of the Congo river according to Tuckey.

mountains in which the rivers of the interior originated, as well as those in which the maritime streams had their sources. Possibly the interior rivers received their appellations from an imaginary communication underground with the maritime. It is on the interior Cinyps that Ptolemy places Sabæ, now Sebha, and Garama; though, as I have already hinted, his position of them is more than 300 miles to the southward of the reality, and though the reports of modern travellers do not countenance a belief of the existence of any river at all in Fezzân.

But admitting that in these and other particulars Ptolemy was certainly misinformed, there still remains enough, in his data on Interior Libya and Northern Æthiopia, to show a real geographical approximation, very distant indeed from the accuracy at which science is always aiming, but quite sufficient to resolve the question as to the identity of the Nigir, in which an approximation is all that can be expected or required. Having been totally ignorant of the countries through which that river flows in a southerly direction, Ptolemy naturally mistook it for a river of the interior: he knew the middle Æthiopia to be a country watered by lakes, formed by streams rising in mountains to the southward;—he was superior to the vulgar error of supposing that all the waters to the westward of the Nile flowed into that river, and he knew, consequently, that the rivers and lakes in the middle region had no communication with the sea. It is but lately that we have ourselves arrived at a certainty on this important fact. We now know enough of the level of the lake Tjad to be assured that no water from that recipient can possibly reach the Nile. This wonderful river, of which the lowest branch is 1200 geographical miles from the Mediterranean, (measuring the distance along its course, in broken lines, of 100 G. M. direct,) has no tributary from the westward below the Bahr Adda of Browne, which is more than 1600 miles from the sea, similarly measured. It is scarcely possible, therefore, that the latter point can be less, taking the cataracts into consideration, than 1500 feet above the sea; whereas the following considerations lead to the belief, that the Tjad is not more than 500 feet in height:—*

We learn from the information of Clapperton, confirmed and amplified by that of Lander, that there exists a ridge which, about Kano and Kashna, sends forth the Yéu to the lake Tjad on one side, and, on the other, the river of Sakkatú, which joins the Quorra at a distance from the sea of about 500 miles, measured in the manner above-mentioned. A similar process of measure-

* The barometrical data of Dr. Oudney produce, indeed, a higher elevation; but, as he had ‘doubts of the accuracy of his barometer,’ no great reliance can be placed on those data.

ment gives a length of 1700 miles to the whole course of the Quorra, the sources of which, according to Major Laing, are about 1600 feet above the sea ; the stream, therefore, has an average fall of something less than a foot in a mile, on lines of 100 g. m. This would give to the confluence of the river of Sakkatú with the Quorra a height of less than 500 feet above the sea, but as that confluence occurs above the most rapid part of the main stream, 500 feet seems to be very nearly the height.

It is not probable that the lake Fittre is very different in its level from the lake Tjad, nor any other lake which may exist between Bornú and Darfúr, and which may be formed, in the same manner as the Tjad, by rivers flowing from the same range of mountains in which the Shary has its sources. As to the Wady, or Dry River, at the eastern extremity of the lake Tjad, of the existence of which Denham convinced himself by information obtained very near the spot, it is obvious that even if this were an outlet to the Nile, its contribution to that river could only be small and casual, since the same information proves that the Wady seldom contains any water. Possibly it is an occasional communication through the Bahr el Ghazél to lake Fittre, nature having, perhaps, provided for the irrigation of all the parts of Æthiopia northward of the great range of mountains, and lying between the Nigir and the Nile, by rivers terminating in inundations, which diminish in the dry season, when some of them may be totally dry, like the Taka to the eastward of Shendy, which was visited by Burckhardt ; while others may be only partially dry, like some of the recipients on the southern side of the mountains of Barbary, and like many basins on the outskirts of the valley of the Nile.* It is not impossible that all the lakes between Háussa and Darfúr may have Wadys of communication from one to another, which may generally be dry, like the Wady of the Tjad, but may serve, in case of the superabundant inundation of one river, to spread the water equally over all the lower parts of this extensive country.

I am aware that many persons are of opinion that the freshness of the water in the lake Tjad is a proof of its having a stream flowing from it, on the principle that as all rivers hold saline particles in solution, the saltness of the lake will continually increase if there be no expenditure but by evaporation. But although the theory may be correct ; although lakes, without outlets, having steep margins, which prevent any enlargement of surface, may thus become strongly impregnated with salt, shallow lakes, formed by periodical inundations, like the greater part of those in North Africa, may be very differently affected. Here a great part of the

* Shaw informs us that one of those recipients on the southern side of the Algerine mountains was called Shott, which seems to be only a dialectic variety of the same word pronounced Tjad, or Djad, in the southern countries.

salt being left on the margin, as the evaporation takes place, is absorbed by the vegetation, while the salt in the permanent part of the lake will keep that water at the bottom by its weight, when the inundation takes place, or, at least, will cause it to be only partially mixed with the new supply,—so that the upper surface of the lake will be always nearly, if not quite, as fresh as the river which forms it. That, in fact, all such lakes are fresh, or nearly so, notwithstanding their having no outlet, may be shown from a multitude of examples. It is sufficient to mention the Zurra in Persia, which is formed by the river Helmund, by the Greeks called Etymänder, the lakes Nessouis and Bœbeis in Thessaly, the lake Mæris in Egypt, and a series of lakes which, with the streams flowing into them, occupy a length of two hundred miles in the interior of Asia Minor. These last form an exact parallel with the Tjad, in having, at no great distance from them, salt lakes, and a large tract of country producing salt on the surface,—facts which furnish the further proof that a great degree of saltiness in lakes depends neither upon outlets nor margins, but upon local causes, as we see exemplified in the Dead Sea, of which some of the cliffs are of solid salt.

The evidence which Ptolemy has left us of his knowledge of the general structure and hydrography of the Bilad-es-Sûdan, as well as of Meroë and the three great tributaries of the Nile, render his testimony on the origin of the western branch of that river the more worthy of attention, notwithstanding the enormous southerly extension, which he has given to the Astapus, or Blue River, and, therefore, in all probability, to the Nilus, or White River also. In considering the latter as the real Nile, he agrees with Herodotus, inasmuch as the historian states, that the Nile came from the westward, and that the Automoli dwelt at a distance above Meroë, which was equal to that of Meroë above Elephantine,* thus placing the Automoli on the White Nile, in the country now inhabited by the Denka. Under the Ptolemies, the Greeks had already exploded the vulgar error which prevailed in the time of Herodotus, of supposing that the rivers of Western Africa flowed to the Nile. About 220 B.C. Eratosthenes, the librarian of Alexandria, had a knowledge of the entire course of the river more correct than has been attained by moderns until within a few years;† and upon comparing his remarks with those of Arte-

* Herodot. i. 2, c. 30, 31.

† Eratosthenes was well informed on the course of the Nile above Egypt, and particularly as to the great south-western bend of Dongola, which was scarcely known, to the moderns before the journey of Burckhardt into Nubia. It was from Eratosthenes that Strabo derived his information on the peninsula of Meroë, and it was probably from the same source that Artemidorus, of Ephesus, learnt that the city of Meroë was fifteen days distant from the sea. Eratosthenes described the island of Meroë as formed of two branches of the Nile, named Astaboras, now Atbara and Astapus; but added, that the latter was sometimes called Astasobas, while the name Astapus was

midorus, Strabo, and Ptolemy, it appears that not much information was ever added to that of Eratosthenes, either on the Nile or on its branches, which form the great peninsula of Meroë,—or island of Meroë, as the Greeks called it,* in the same manner as the peninsula above the confluence of the White and Blue Rivers, is now called the island of Sennaar. As Eratosthenes agrees with Ptolemy in placing lakes at the head of both the great branches of the Nile, and as this has been found correct as to the Blue Nile, there is some reason for presuming that the Proper or White Nile may have a similar origin; and if we suppose Ptolemy to have placed the two lakes of the Nilus, or White River, 12° to the south of their real position, as he is proved to have placed the lake Coloe at the source of his Astapus, or the Abyssinian branch, it will follow that the lakes of the White River are about the latitude of 5° north.

There are only three modern authorities from which we derive any information on this great question of African geography, which, in spite of Bruce, still remains the same problem it has ever been. The first of these is Browne, whose inquiries in Darfúr tend to prove the sources of the river to be about lat. 7°, and long. 27°,—not in lakes, but in many streams, flowing from the Djebel el Kamr, or Mountains of the Moon, which is precisely the name given by Ptolemy to the mountains at the source of the Nile, and which Denham also found attached to a part of the same great range, farther to the west. The second is Linant, who travelled for the African Association, and who, in the year 1827, surveyed the course of the White Nile from the confluence of the Blue

applied to another river rising in certain lakes to the south, meaning the White River. This agrees with Ptolemy, inasmuch as he clearly attaches the name Astapus to the Blue or Abyssinian Nile, and derives the Nilus, or Proper Nile, that is to say, the White River, from lakes situated far to the south. On the other hand, Artemidorus, Strabo, and Pliny, followed those authorities alluded to by Eratosthenes, who gave the name Astapus to the White Nile, and that of Astasobas to the Blue River. The latter name may be accounted for by the discoveries of late travellers; from whom we learn, that on the right bank of the Bahr el Azrek, or Blue River, a little above the fork at Khartúm, there are some ruins called Soba, apparently of the same age as those of Meroë; whence it would seem that Astasobas meant the river of Soba, and that the Ast, which enters into the composition of this and the two other names of the rivers of Meroë, implies *river*, having probably been introduced into that country by the Egyptian Greeks from Macedonia, where we find its elements, doubtless with the same import, in the names Astræus, Strymon, and, perhaps, also the modern Vistritza. Astapus, in fact, was the name of a Macedonian city (now called Istib), and not improbably of the river, also, upon which that town is situated. When the Blue Nile had generally assumed the appellation of Astasobas, that of Astapus may still have distinguished the united stream as far as the junction of the Astaboras, and may at length have become attached also to the White River above the fork, by a process which has often changed the names of rivers, especially when formed of two nearly equal branches. The Scamander of Troy is a remarkable instance. The Simoeis of Homer was the Scamander of the time of Strabo.

* Eratosth. ap. Strabon. p. 786.—Artemid. ap. Strabon. p. 771.—Strabo, p. 821.—Plin. H. N. l. 6, c. 29.—Ptolem. l. 4, c. 8.

River to Aleïs,—a direct distance of 132 geographical miles. But the most recent information has been obtained by a slaving party, headed by Ibrahím Kashef, an officer of the Viceroy of Egypt, who set out from Khartúm at the fork of the two rivers. The men composing this expedition marched for thirty-five days along both banks of the river,—a portion on each side. On the twelfth day they reached the first island of the Shillúks, traversed the territory of that people for fifteen days, and, on the twenty-ninth day, entered that of the Denka, from which they returned at the end of six days. The river was then shallow, full of islands, six hours in breadth, and there were no mountains in sight. The latter part of the march appears, from the description of Ibrahím, to have been in a direction nearly west; so that if the first island of the Shillúks, which they reached on the twelfth day, was not far from Aleïs, as Linant's Journal gives reason to believe, the extreme point attained by them was about 29° E. longitude, and 10° N. latitude. The result of the last expedition agrees with that of Browne's, inasmuch as it gives an easterly course to that part of the river which lies to the south of Darfúr; and as it makes the sources of the river to fall to the south-westward of that kingdom not farther northward than 7° N. It supports the opinion, also, that Browne's Donga is no other than the country of the Denka; that both the sources and mountains are more distant than Browne's informants supposed; and still leaves the possibility, therefore, that Ptolemy was right in describing the river as originating in lakes. In fact, the enormous breadth attributed to the river by the Turkish slaving party, although it may be an exaggeration, and is certainly not to be reckoned by the usual allowance of the itinerary hour, leaves little doubt that the river, at the extreme point of their journey, was much broader than at its junction with the Blue Nile; and indicates, therefore, that its conformation is of an extraordinary kind,—its origin being, perhaps, in a lake or lakes, which may be supplied by streams flowing from a distant range of mountains.

The existence of lakes having a communication with the river only in time of high water, is rendered highly probable by a passage in the journal of M. Linant, which states, that at the time of the inundation of the White River, an incredible quantity of fish is brought down towards Khartúm by the current.*

As a want of success alone caused the return of the Turkish slaving party,—the natives constantly eluding their pursuit,—it seems evident, that if geographical discovery instead of man-stealing had been their object, they might have explored the river much

* [M. Linant's Report to the African Association having been merely printed for the use of its members, and neither published nor translated, will be found, somewhat condensed and abridged, in another part of this volume.]

farther ; and that it might consequently be in the power of the Viceroy of Egypt to arrive at the mysterious sources, or to escort an European mission thither, if a motive sufficiently powerful should ever prompt him to assist in the attempt. In the mean time, a route by water, in the direction of the sources of the White Nile, is now afforded from the westward by means of the newly-discovered branch of the Quorra called Shary, or Shadda, or Tjadda, which, being one mile and a half in breadth at its junction with the Quorra, is probably navigable for a great distance above the confluence. It is proper to observe, however, that this stream can hardly carry us very near the sources of the White Nile, as it probably originates not far from the mountain of Mendefy, which Denham saw in latitude 8° N., and which he compares to one of the granite peaks of the Alps ; for this Shary is apparently the same river which his informants described to flow through the country of Adamowá, and which he concluded to be a branch of the Shary of Bornú, by the same kind of error as that of Bello and others, who have thought that the Quorra flowed to the lake Tjad,—the error, in both cases, arising from the identity of name, from a want of observation in the natives as to the course of the waters, and from the fact of both the Sharys rising nearly in the same point. Denham was so completely puzzled by this riddle, that having been informed at Loggun that the Shary of Bornú has an easterly branch, (possibly the same river as the Bahr Kulla of Browne,) he supposed it to be a continuation of the river of Adamowá, and to terminate in the lake Fittre.

As a knowledge of the origin and course of rivers conducts, in every country, to that of the relative altitude and direction of its highlands, the late discoveries on the waters of Africa have thrown great light on its orography. The sources of the largest, or rather longest, of its rivers, namely, the White or true Nile, now appear to be in a point nearly equidistant from the Indian and Atlantic Oceans in one direction, and from the Mediterranean and the Cape of Good Hope on the other. These central summits, it is fair to suppose, are at least as high as the snowy peak Samen in Abyssinia, which is the culminating point towards the sources of the minor branch, or Blue Nile, and that they are covered therefore with perpetual snow. From hence flow the White Nile, the Djyr, the Bahr Kulla, the Congo, and several rivers of the coast of Zanguebár.

As a part of these great African Alps was described to Denham as lying beyond the mountain of Mendefy, the latter would seem to be an advanced northerly summit of them. The range is probably united to the eastward with the mountains of Abyssinia, and, to the westward, terminates abruptly in some lofty peaks on the eastern side of the Delta of the Quorra, but not till after it

has sent forth a lower prolongation, which crosses the course of the Quorra nearly at right angles, and terminates, at the end of 1500 miles, at the sources of the Quorra, Gambia, and Senegal. A minor counterfort advances from the central range to the north-westward, commencing about the peak of Mendefy and vanishing at the end of about 900 miles in the desert of the Tuariks. It gives rise to the two Sharys which flow in opposite directions to the Quorra and the lake Tjad, and further north to the streams which flow to the same two recipients from about Kano and Kashna.

Though the knowledge of Interior Africa now possessed by the civilized world is the progressive acquisition of many enterprising men, to all of whom we are profoundly indebted, it cannot be denied that the last great discovery has done more than any other to place the outline of African geography on a basis of certainty. When to this is added the consideration, that it opens a maritime communication into the centre of the continent, it may be described as the greatest geographical discovery that has been made since that of New Holland. Thrice during the last thirty years it has been on the eve of accomplishment; first, when Hornemann had arrived from Fezzán at Nyffé; secondly, when Park had navigated the Quorra as far as Bussá; and, lastly, when Tuckey, supplied with all possible means for prosecuting researches by water, was unfortunately expedited to the Congo, instead of being sent to explore the mouths of the NIGIR.

II.—*Notes on a Part of the Eastern Desert of Upper Egypt.* Accompanied by a Map. Communicated by J. Wilkinson, Esq. Read the 28th Nov. 1830.

[The following notes are extracted from a manuscript volume of Researches in Upper Egypt, by J. Wilkinson, Esq., the greater part of which consists of remarks on Egyptian antiquities, with reference to a large collection of drawings made by Mr. Wilkinson. With the exception of a journey on the Bahr Yousuf, by means of which Mr. Wilkinson corrects the position of Bahneséh, as laid down on the maps, and places it due west of Abugirge, on the Nile, the only remarks in the manuscript interesting to geography are contained in the following]

JOURNEY IN THE EASTERN DESERT.

IN February, 1823, I set off from Cairo, for that part of the Eastern Desert which lies north of Kéneh, in company with Mr. Burton,* and protracted my stay in those mountains till the

* An abstract of Mr. Burton's journal, transmitted to Mr. Greenough, appeared in the 'Morning Chronicle,' Oct. 23, 1824.